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/*
 * Name      : DistCalcWGS84.cs
 * Project   : Sparkling Science
 * Language  : C#
 * Purpose   : Distanzberechnung mit geographischen Koordinaten
 * Author    : DI (FH) Christoph Erlacher
 * Date      : 11-11-2008
 * Source    : http://de.wikipedia.org/wiki/Orthodrome
 * Liability : The entire risk as to the results and performance of the
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                including loss of profits or consequential damages,
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                the use of the Source Code.
*/

using System;
using System.Collections.Generic;
using System.Text;

namespace Abstands Berechnung Mit GPS Koord
{
    class DistCalcWGS84
    {
        //Konstanten Erdabplattung und Erdradius in Kilometer
        private const double erdAbplattung =
0.0033528106647474807198455286185206;
        private const double erdRadiusKm = 6378.137;

        public DistCalcWGS84()
        {

        }

        public static double getDistanz(double laenge1, double breit1, double
laenge2, double breite2)
        {

            double F = (breit1 + breite2) / 2;
            double G = (breit1 - breite2) / 2;
            double L = (laenge1 - laenge2) / 2;

            F = (Math.PI / 180) * F;
            G = (Math.PI / 180) * G;
            L = (Math.PI / 180) * L;

            //Ermittlung des groben Abstands

            double S = Math.Pow((Math.Sin(G)), 2.0) *
                Math.Pow((Math.Cos(L)), 2.0) +
                Math.Pow((Math.Cos(F)), 2.0) *
                Math.Pow((Math.Sin(L)), 2.0);

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double C = Math.Pow(Math.Cos(G), 2.0) *
           Math.Pow(Math.Cos(L), 2.0) +
           Math.Pow(Math.Sin(F), 2.0) *
           Math.Pow(Math.Sin(L), 2.0);

double w = Math.Atan(Math.Sqrt(S / C));

double groberAbstand = 2 * w * erdRadiusKm;

//Korrektur des groben Abstands durch die Faktoren H1 und H2

double R = Math.Sqrt(S * C) / w;

double H1 = (3 * R - 1) / (2 * C);

double H2 = (3 * R + 1) / (2 * S);

double korrigierterAbstand = groberAbstand *
                             (1 + erdAbplattung * H1 *
                              Math.Pow(Math.Sin(F), 2.0) *
                              Math.Pow(Math.Cos(G), 2.0) -
                              erdAbplattung * H2 *
                              Math.Pow(Math.Cos(F), 2.0) *
                              Math.Pow(Math.Sin(G), 2.0));

return korrigierterAbstand;
}

}

```